Section 13 Sevier River Basin
DISASTER AND EMERGENCY RESPONSE

Tables

Figure

Section Thirteen Sevier River Basin- State Water Plan

Disaster and Emergency Response

Disasters are always traumatic experiences for those affected. Preparedness is the key to alleviating these experiences.

13.1 INTRODUCTION

This section discusses flood hazard mitigation and disaster response activities. It also describes predisaster or immediate actions needed to protect water and water-related resources in the Sevier River Basin. It describes programs and mechanisms now in place along with those needed. After the fact reactions are more inefficient and require more time, money and other resources. It also portends loss of life and threatens the health and welfare of those affected.

Most water-related emergency situations are naturally caused although man often increases the magnitude. They vary from disastrous flooding to extreme drought. Man-caused emergencies include oil and chemical spills and other polluting activities that threaten water supplies. Some disasters result from a combination of natural forces and man's activities.

13.2 BACKGROUND

Natural disasters and other emergencies are a part of the area's history. Floods have been a perennial problem. Earthquakes and other natural disasters have occurred less frequently and have caused only minimal damage.

The first recorded flood in the Sevier River Basin occurred at Manti from Manti Creek on August 1, 1852. The most damaging flood in Manti resulted from a cloudburst on July 11, 1899. As reported in the Deseret Evening News, ". . . The two city creeks overflowed . . . poured a muddy deluge filled with floating driftwood, debris, haystacks, and bridges . . . haystacks, hen coops, and stables were swept away. . . sickly people had to be rushed from their homes . . . " This flood warned the west of the results of nearly 50 years of over-grazing.

A life was lost in August 1889 in Wood Canyon near Mayfield. "The main stream was directed against the Jorgensen home within which were Mrs. Jorgensen and six children. Mr. Jorgensen arrived and left his buggy and team on high ground . . . His oldest boy came out to help with the horses . . . the other five children were floating around on a lounge in 3 feet of water and his wife holding up a cupboard to steady herself and also to prevent it from falling on the children. Mr. Jorgensen broke a window to make an exit for the water. He then saw . . . the buggy and horses rolling over and over. The boy . . . was drowned and also cattle and horses."

A large flood at Mt. Pleasant interrupted the Pioneer Day celebration on July 24, 1946. It was reported, ". . . The force of this mortar like mud with its accompanying load of rocks and logs was such that boulders up to 10 feet in diameter were moved . . . " This was the most destructive flood in the basin until the area-wide flooding along the Sevier River in 1983.

The "Floods of the '80s" in the Sevier River Basin began near the end of May 1983 with a sudden rise in temperature that started melting a record high snowpack. Flood damages were recorded throughout the basin. Total damages are unknown but probably exceed $50 million not including loss of a railroad and considerable damage to the natural resources. The D&RGW Railroad spur from Thistle to Marysvale was destroyed to the point it was not rebuilt. Upper watersheds will require decades to return to pre-flood conditions. Irrigation facilities throughout the basin were damaged or destroyed. The DMAD Reservoir dam spillway failed requiring breaching of Gunnison Bend Reservoir dam. As a result, the town of Deseret was inundated with up to five feet of water.

Flooding continued during the spring and early summer of 1984 causing less damages than during the previous year but still probably exceeding $15 million. Sevier Lake filled up to the shoulders of U.S. Highway 6-50, something that hasn't

occurred in recent memory. People were fishing from boats in the fresh water of the Sevier River flowing into the lake, a strange sight in a remote desert area. Dead sheep along the lake shore demonstrated the fallacy of drinking the salty lake water.

Historically, floods in the basin have claimed six lives. There may be more. Most communities are susceptible to flooding as they were usually located at the mouths of canyons with perennial streams. Because of this, flooding has become an ongoing problem.

Earthquakes have occurred periodically and are associated with three major faults. The Sevier and Paunsaugunt faults run north-south the entire length of the basin. The Elsinore fault is shorter, primarily located in Sevier Valley. The Elsinore fault is the most active but there is no record of excessive damage. Major fault lines are shown on Figure 13-l.

All levels of government have statutory authority to carry out disaster related programs. However, no one entity has all of the necessary authority to implement actions to mitigate and respond to disasters. This lack of an umbrella of authority is discussed in the *Utah State Water* Plan-1990 See Section.3, Introduction; Section 13, Disaster and Emergency Response; and Section 16, Federal Water Planning and Development.

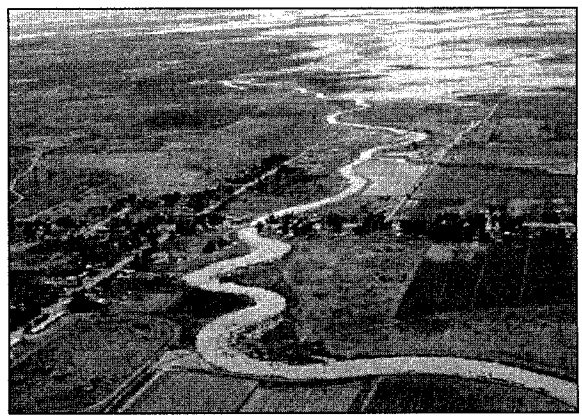
13.3 ORGANIZATIONS AND REGULATIONS

Local government has the primary responsibility to initiate action in response to a disaster or emergency. If the town or city impacted cannot handle the emergency situation, they call on the county for assistance. The county can call for assistance from the state who turns to the federal government when necessary.

13.3.1 Local

When an emergency occurs, local governments are required by the Division of Comprehensive Emergency Management to carry out the following tasks to provide an effective first response:

- Prepare an emergency operations plan for the coordination of local and county emergency responses, and link it to potential assistance from appropriate federal and state agencies.
- Provide necessary resources (including special supplies and equipment) to support emergency relief operations and list these resources. Procedures to be followed for obtaining assistance and use of resources in the emergency operation plans should be included.
- Assign and train personnel needed to carry out disaster relief functions.
- Provide the State Disaster Coordinating Officer with copies of current emergency operations plans.
- Recommend changes to state and local emergency disaster relief procedures and assigned functions as needed.



Flooding near Deseret

Cities and counties have primary responsibility for disaster response as stated in Titles 10 and 17 of *Utah Code Annotated, 1953, as amended.* Most local governments have delegated disaster responsibilities to specific individuals. Table 13-1 shows the position responsible for disaster response in each county.

13.3.2 State

The Division of Comprehensive Emergency Management (CEM) provides a statewide system

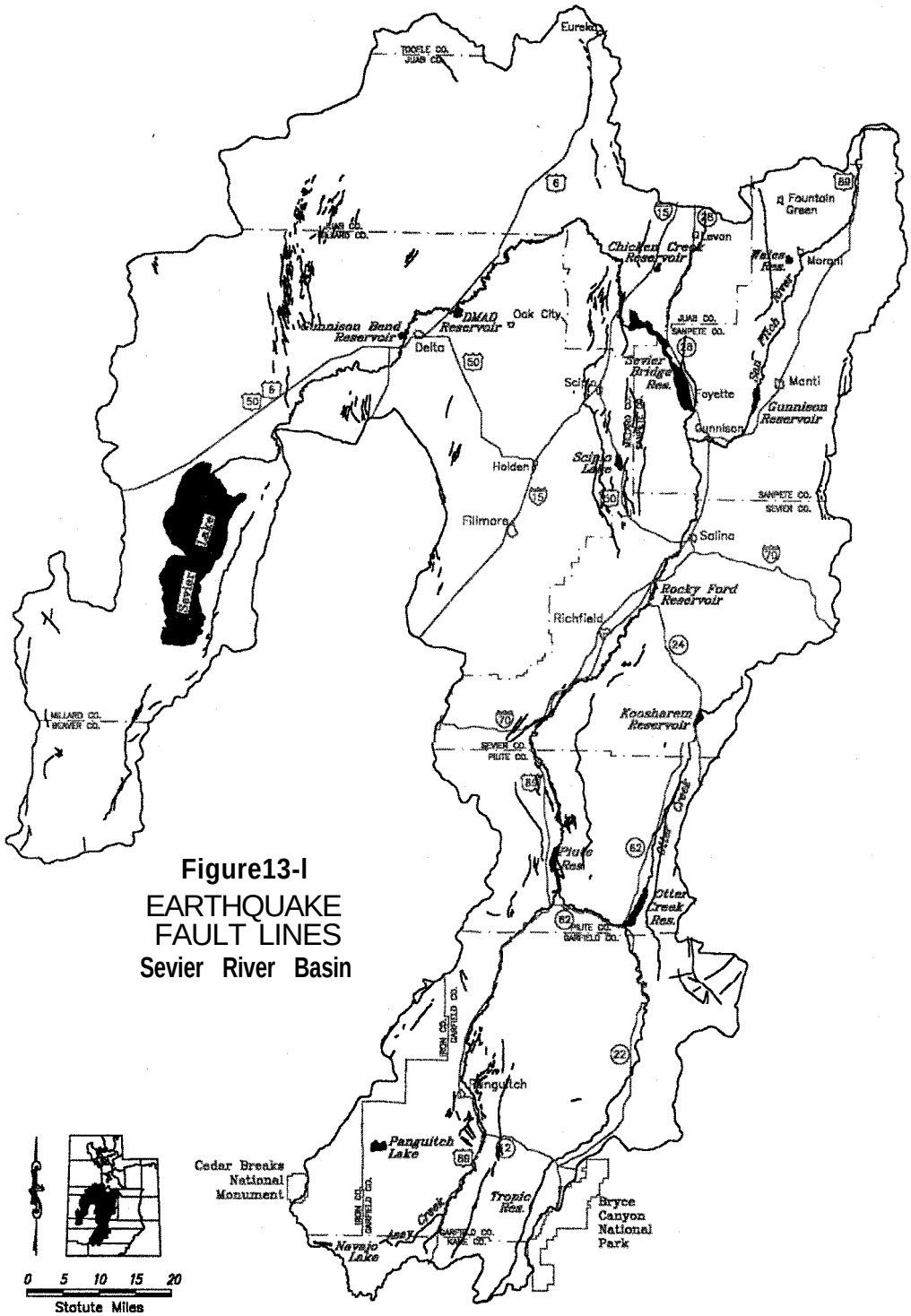


Figure13-I
EARTHQUAKE
FAULT LINES
Sevier River Basin

Table 13-1
DISASTER RESPONSE RESPONSIBILITY

County	Responsible Position
Garfield	Sheriff-Director, Garfield Co. Emergency Services
Iron	Sheriff-Director, Iron Co. Civil Defense
Juab	Director, Juab Co. Emergency Services
Kane	Director, Kane Co. Emergency Services
Millard	Sheriff-Director, Millard Co. Emergency Services
Piute	Sheriff-Director, Piute Co. Emergency Services
Sanpete	Director, Sanpete Co. Civil Defense
Sevier	Director, Sevier Co. Emergency Services

or plan encouraging and assisting counties and cities with activities relating to emergencies and disasters. They are responsible for assisting towns, cities and counties prepare emergency response and management plans, comprehensive in scope but allowing effective and close cooperation with state and federal agencies in the event of a disaster beyond local capabilities. CEM also works closely with other state and federal agencies to assure needed resources reach areas seriously affected by a major disaster. This is done primarily through the Inter-Agency Technical Team (IAT) consisting of technical experts from virtually every discipline relating to water and natural resources representing many state and federal agencies. CEM's hazard mitigation officer is coordinator for IAT and may be contacted at 538-3400 for assistance.

When the extent of the disaster or emergency is beyond local capability, the governor, at his discretion, can declare a "state of emergency" and provide state assistance. The governor may also request federal assistance if deemed necessary. At this time, the State Disaster Coordinating Officer (SDCO) assumes all responsibility for distributing both state and federal assistance to alleviate local disasters. This is carried out in cooperation with local disaster officials.

The SDCO also serves as the governor's primary point of contact for all disaster coordination and related correspondence between the federal, state and local disaster management officials.

13.3.3 Federal

The President of the United States may declare that a major disaster has occurred at any time, usually at the governor's request. At this time, federal assistance is provided for disaster response, recovery, preparedness and mitigation through the Federal Emergency Management Agency (FEMA). This assistance is distributed under the direction of the federal coordinating officer designated by FEMA and the SDCO.

Other federal agencies also have disaster related assistance programs. Most of these can be invoked under agency policies and guidelines even though a presidential disaster declaration does not exist. These are generally coordinated through state and local officials. Specific programs are provided by agencies such as the Corps of Engineers, Farm Service Agency, Natural Resources Conservation Service and Civil Air Patrol.

The National Flood Insurance Program (NFIP) is administered by FEMA. This program requires flood insurance on all development in the flood plains as determined by topographic surveys. Lack of flood insurance denies use of any federal or federally insured monies for development in flood plains.

13.4 FLOOD PROBLEMS

The Sevier River Basin is impacted by three types of storms: general winter storms, general summer storms and summer thunderstorms. At

times, rain on snowpack or frozen ground cause floods.

13.4.1 River and Stream Flooding

Long-term floods produced by snowpack melt resulted in the 1983-85 events, particularly on the Sevier River mainstem. Tributary drainages are subject to flooding from cloudburst storms on a more frequent basis. Generally, floods resulting from these high-intensity thunderstorms occur most often and do the most damage. Nearly all tributaries have produced one or more flash floods in the past. Higher risk flood-prone communities include Panguitch, Monroe, Manti and Fillmore. Flood peaks for selected locations are shown in Table 5-2.

Manmade and natural obstructions in flood plain areas can affect flooding, These restrict flood channels and can cause overbank flows.

Flood plain maps have been prepared for many communities. Maps for Panguitch, Richfield, Salina and Manti are shown as examples on Figures 13-2 thru 13-5. The FEMA flood plain boundaries shown are approximate and those living outside the boundaries should not assume they are without risk from flooding. There are communities that do not participate in the National Flood Insurance Program, some because they are outside the flood plains.

13.4.2 Upper Watersheds and Floods

The major flood source areas are upper watersheds in poor hydrologic condition. This is caused by improper practices that use land beyond its capability. These uses may take a variety of federal agencies to assure needed resources reach areas seriously affected by a major disaster. This is done primarily through the forms such as over-grazing, poor location of roads and trails, cross-country use of vehicles, timber harvesting and mining. Erosion problems are discussed in more detail in Section 10, Agricultural Water.

13.5 DROUGHT PROBLEMS

The climatological history of the Sevier River Basin reveals a cyclic pattern of wet and dry periods. The wet and dry peaks seem to occur at varying magnitudes about every 10 to 30 years. Extreme droughts have occurred during the periods 1934-36, 1955-57, 1960-65, 1977 and during the late 1980s and early 1990s.

Droughts generally do not have large impacts on public water supplies from springs and wells unless they last for an extended period. However, culinary water use increases during time of drought unless restrictions are applied. Surface water flows are usually impacted from the beginning of the drought. Only the larger reservoirs store more than one years supply.

The hot, dry summers make regular irrigation of crops necessary. By mid-season, stream flows are low and in some cases, nonexistent. As a result, crops suffer. In the higher elevations, rangeland production of feed for wildlife and livestock is reduced.

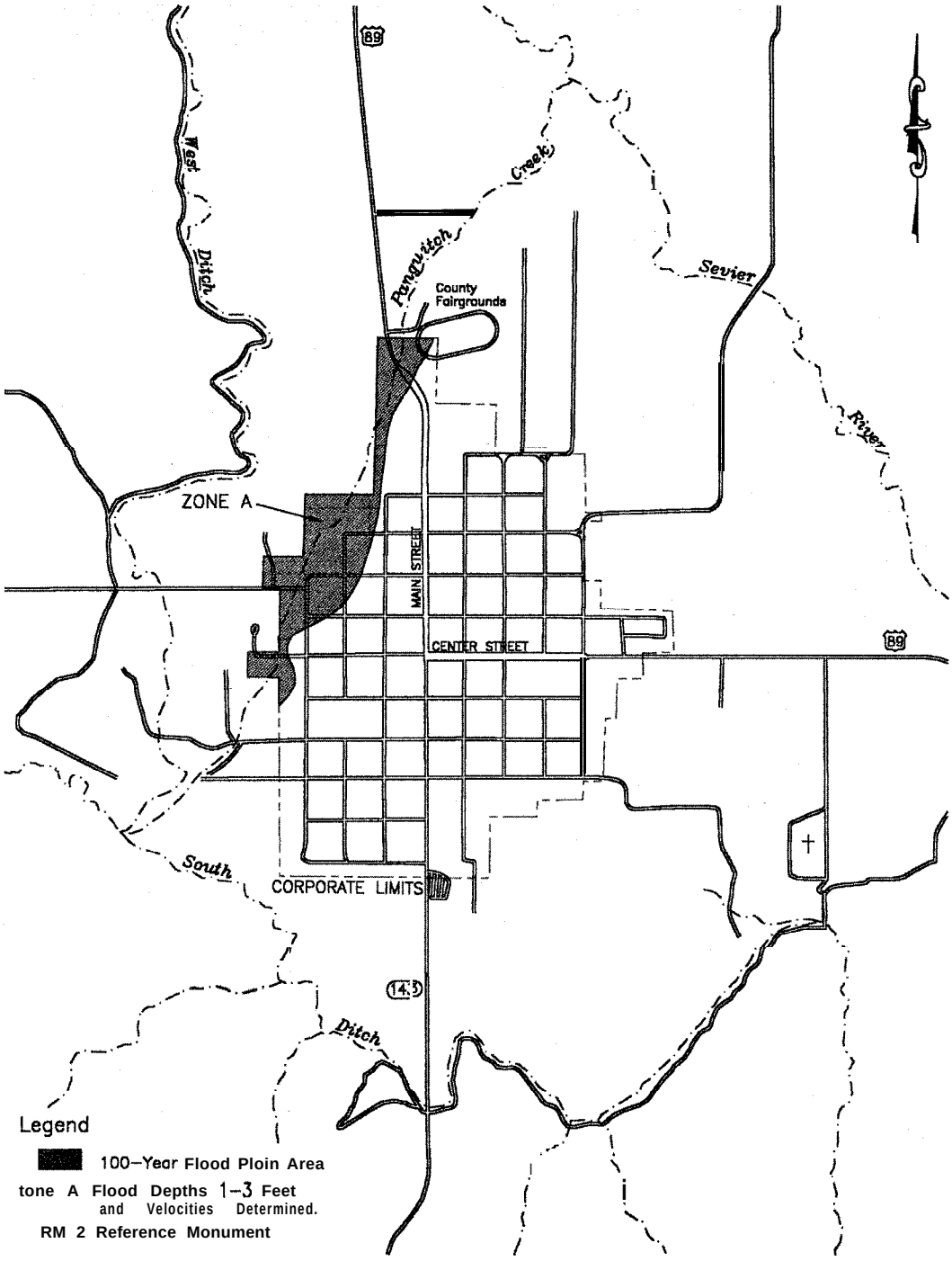
13.6 OTHER WATER-RELATED EMERGENCY PROBLEMS

There are other disasters that can affect the water resources. These include earthquakes, land slides and structural failures.

There is greater potential damage from an earthquake than from any other kind of natural disaster. Three major normal faults traverse the basin in a north-south direction. These are the Paunsaugunt fault, Sevier fault and Elsinore fault. Although the Paunsaugunt and Sevier faults are the biggest, the Elsinore fault is the most active. Earthquakes can disrupt sources of culinary water supplies as well as delivery systems, creating potential danger to the health and welfare of local residents.

Mudslides do not create a large potential danger. The most noticeable evidence of recent mudslides is on the steep west face of the Gunnison Plateau caused by the extreme wet years of 1983-84. Mudslides could disrupt irrigation water delivery systems and drinking water supplies, dam rivers, and damage drinking water tanks.

The major potential structural failures would be the overtopping or breaching of a reservoir dam. This type of failure could be caused by flood flows through a reservoir exceeding the emergency spillway capacity or by an earthquake.



Source: Federal Emergency Monogement Agency (FEMA)
Effective date: 8-28-79

Figure 13-2

PANGUITCW IOO-YEAR FLOOD PLAIN

Sevier River Basin

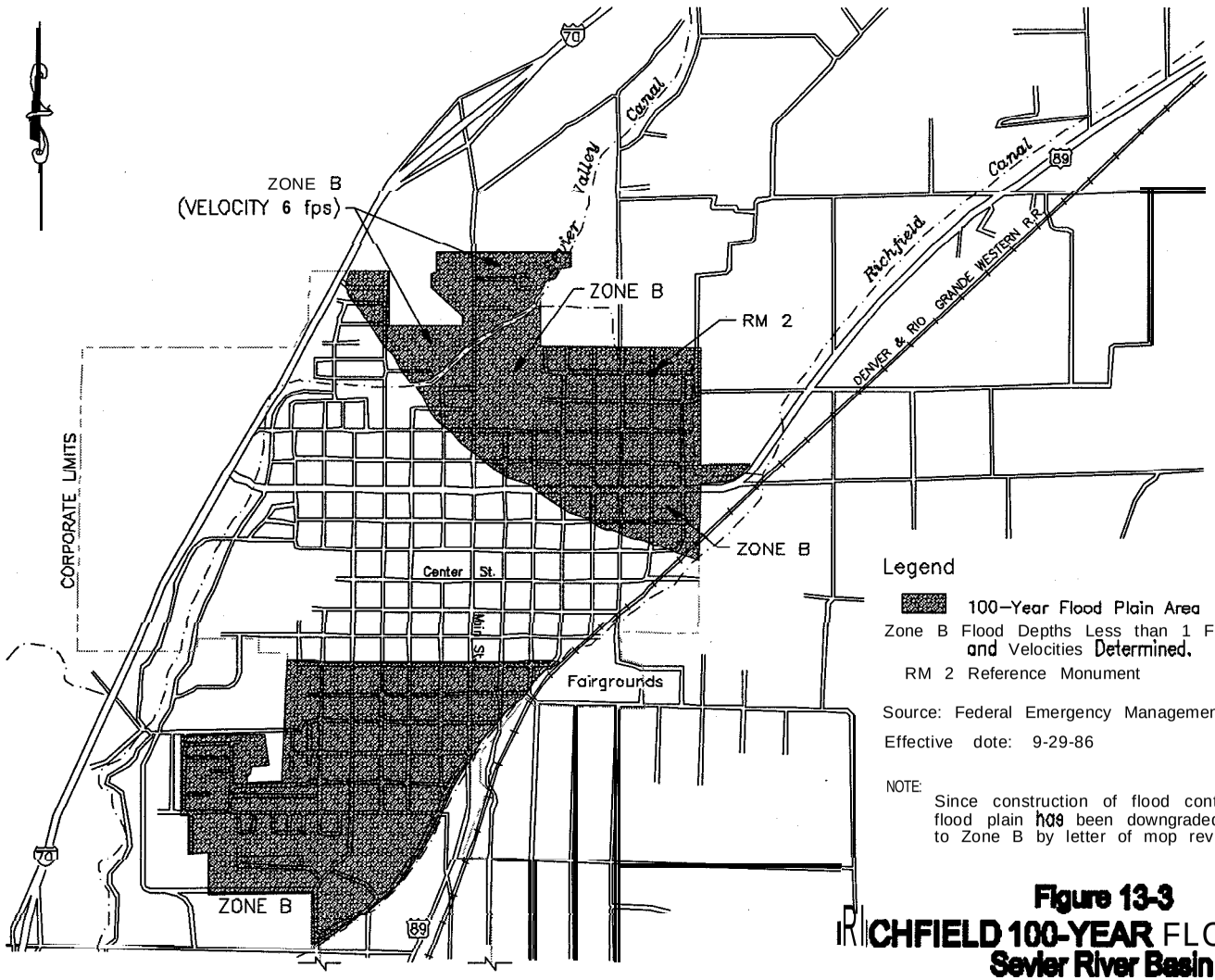


Figure 13-3
RICHFIELD 100-YEAR FLOOD PLAIN
Sevier River Basin

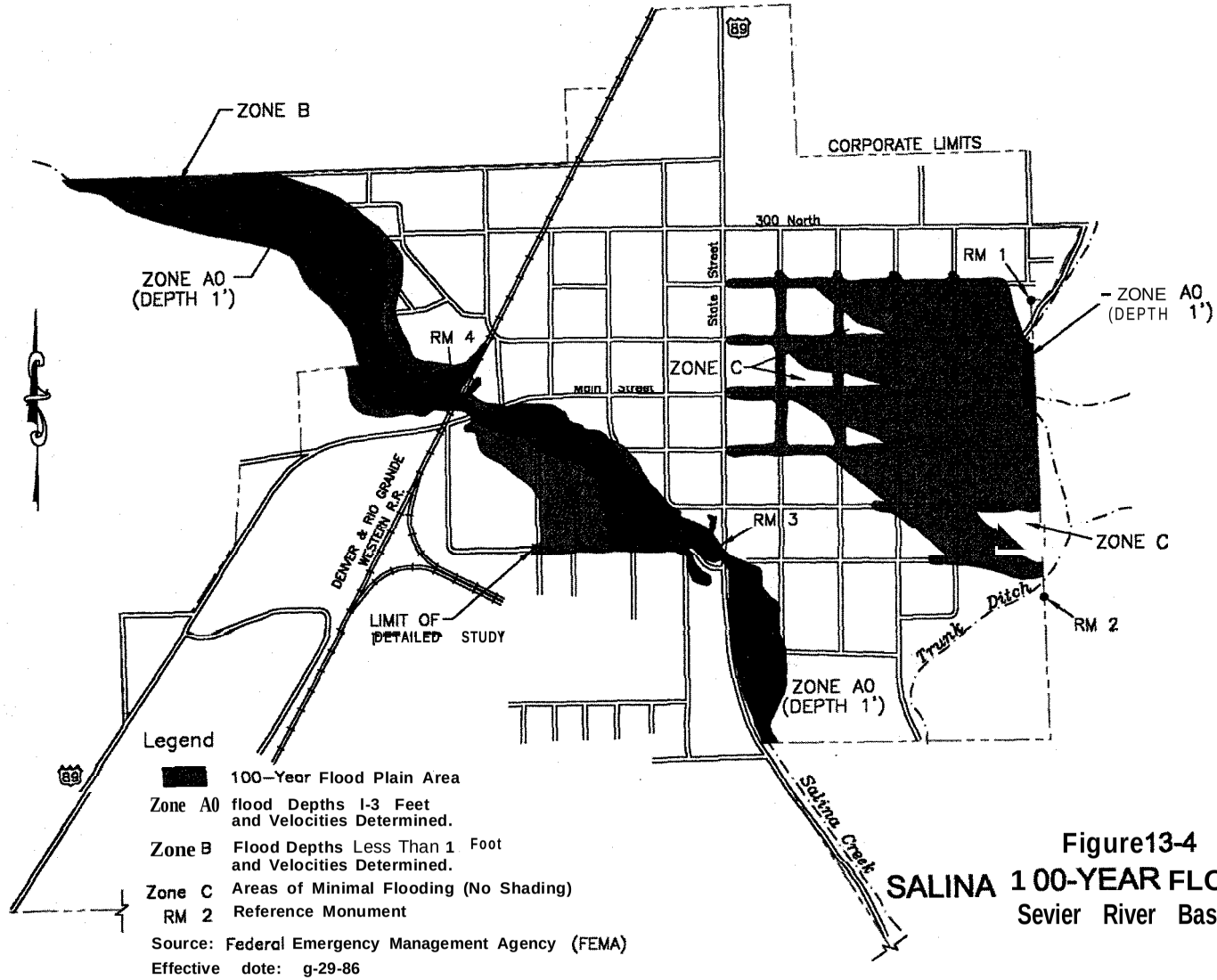
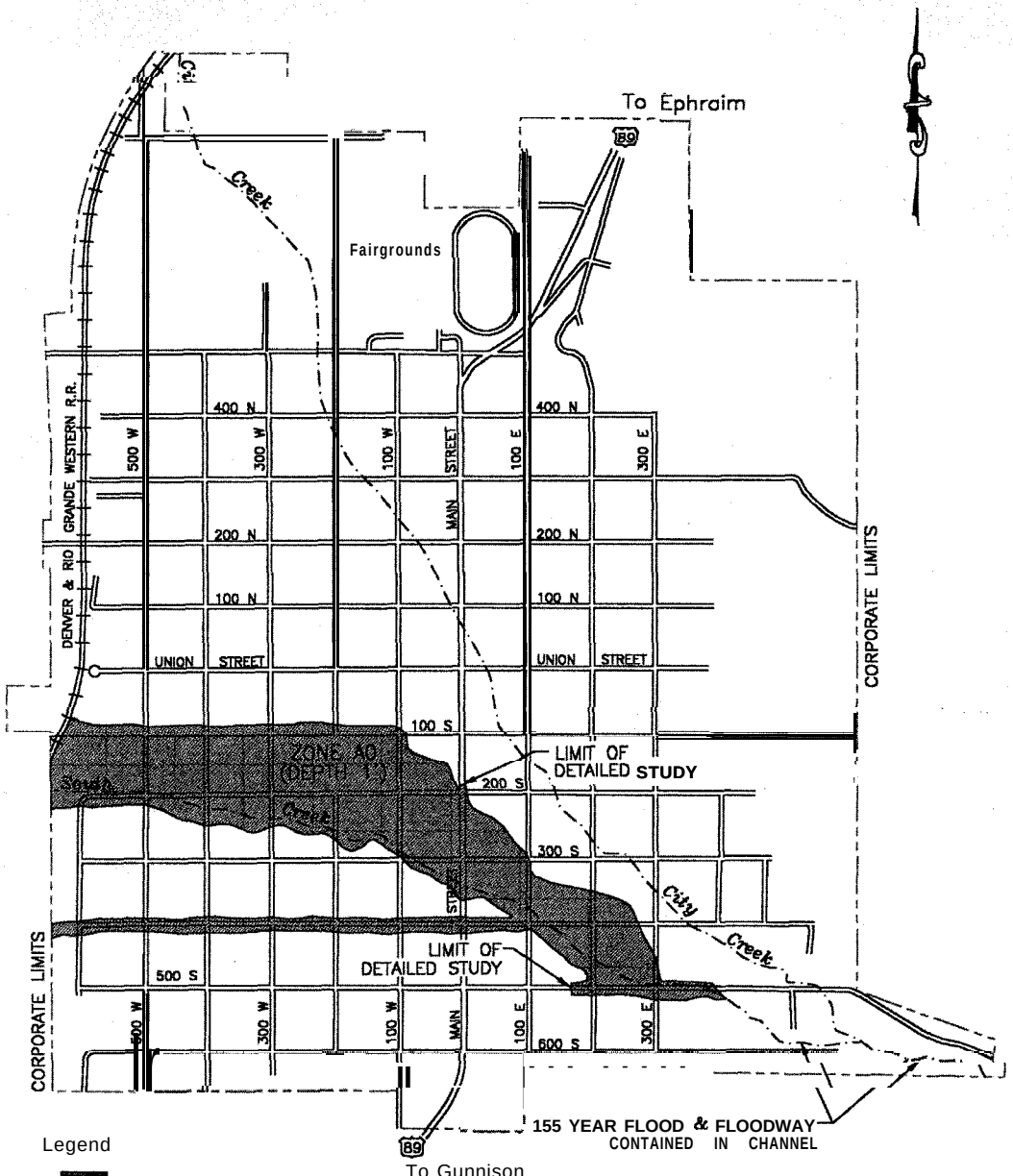


Figure13-4
SALINA 1 00-YEAR FLOOD PLAIN
Sevier River Basin



Source: Federal Emergency Management Agency (FEMA)
Effective date: 8-4-87

Figure 136
MANTI IOO-YEAR FLOOD **PLAIN**
Sevier River Basin

13.7 FLOOD PREVENTION AND DROUGHT CONTROL ALTERNATIVES

For the most part, only the larger storage reservoirs would have appreciable effect on reducing flood flows in major drainages although most reservoirs would have some effect. Most of the reservoirs on tributary drainages can provide some flood control. Flood control reservoirs or flood channel facilities should be considered on tributary drainages where downstream flood damage potential is great. Examples of existing flood control structures are those above Monroe, Richfield, Glenwood, Mt. Pleasant and Kanosh. Others could be added or improved above Manti, Levan and Fillmore.

Investigation of the upper watershed areas could determine the effects of installing nonstructural measures such as vegetative improvement to reduce floods.

Flood plain management may be one of the most viable alternatives to reduce flood damage. Refer to Section 13.9.1 for further discussion of flood plain management.

There are also additional ways to reduce the impact of flooding. Canal and river banks can be strengthened along critical sections. Narrow bridges or other constrictions that would be overloaded can be modified or replaced to decrease the risk of damage from high flows.

Drought impacts can be reduced when the volume of precipitation is increased by weather modification through cloud seeding. However, this requires the right conditions to be most effective. During prolonged periods of drought, it may not be possible to significantly increase the precipitation although it is a viable alternative on a long-range continuing basis. This will maintain the upper watershed soil moisture at a higher level which will tend to moderate the effects of drought. Good management of the upper watersheds is one of the best alternatives to alleviate the impacts of drought.

The current Utah Drought Response Plan was prepared in 1990. The Division of Comprehensive Emergency Management is updating this plan.

13.8 DISASTER RESPONSE ALTERNATIVES

It is always more effective to have plans and/or facilities in place prior to any disaster response requirements. There are several actions that could be put in place to alleviate emergency situations. Suggested actions include the following:

- Development of disaster response plans (Emergency Operations Plans) by individual communities,
- Investigation and construction of water storage and floodwater prevention projects,
- Continuation of cloud seeding programs,
- Family emergency plans, and
- An assessment of sediment/debris flows that could be expected after wildfires.

All of the major reservoirs have disaster response plans in place. In addition, real-time stream gaging stations could be used as an early-warning system for flood situations. These are remote controlled so they can be easily accessed.

Disaster Response Plans or Emergency Operation Plans (EOP) help communities increase their ability to respond to disasters and emergencies. These plans should be prepared ahead of time allowing counties, cities and towns to coordinate efforts and define responsibilities. Decisions should be made on leadership positions and activation of response activities.

All of the counties have EOPs in place. These plans identify hazards in the counties. They also address disruption, contamination or exceptional shortfall in water supplies that can occur during emergency situations. When this happens, water deliveries need to be prioritized to ensure critical needs are met first.

The Division of Comprehensive Emergency Management (CEM) suggests all residents prepare a 72-hour emergency survival kit. This will allow time for relief efforts to reach most residents. Families should have their own emergency plan outlining each member's responsibility during a disaster. Emergency preparedness drills will familiarize family members of their duties and will help ensure the safety of each.

Flood control measures are implemented at the local level. However, CEM coordinates the resources of many local, state and federal agencies. The following steps are used to prepare for floods:

- Coordinate state resources to make them available to counties,
- Evaluate flood risks in local areas,
- Coordinate Army Corps of Engineers and other agency activities and put them in touch with local officials,
- Provide an interagency technical assistance team to evaluate threat and risk of flooding, and
- Coordinate emergency response.

Hazard mitigation may include structural and non-structural activities as they relate to flood prevention. Continued active involvement in the National Flood Insurance Program (NFIP) is essential to ensure adequate flood plain management objectives are in place to reduce flood losses. Hazard mitigation plans should be implemented by communities to deal with specifically identified potential disasters, such as flooding, earthquakes and toxic spills.

13.9 ISSUES AND RECOMMENDATIONS

There is one policy issue. It discusses flood plain management.

13.9.1 Flood Plain Management

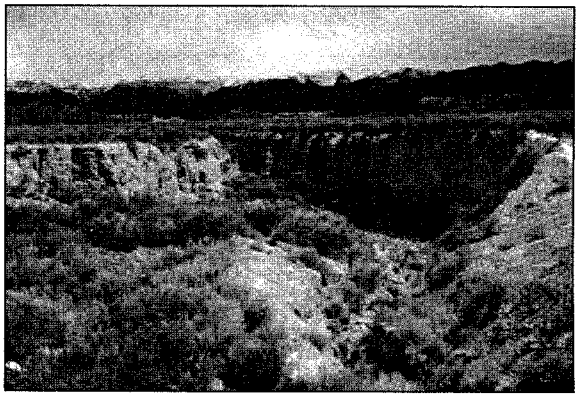
Issue - Some local governments do not have or have out dated flood plain management plans.

Discussion - Many communities are located near the mouths of canyons with perennial streams. These canyons can produce devastating floods causing property damage, loss of life and endangering the health and welfare of the residents. Most of these floods are caused by cloudburst storms which produce high flows. There have been numerous floods of this type recorded from Sevier River tributaries. The prolonged flooding during 1983-84 caused considerable damage on the Sevier River mainstem.

The NFIP was established to reduce large federal outlays for disaster relief. Its purpose is to: 1) Reduce flood loss, 2) prevent unwise development in flood plains, and 3) provide affordable flood insurance to the public.

In order to qualify under the NFIP, communities must pass ordinances regulating development in flood plains. This is required if any federal or federally insured funds are used for construction. The CEM coordinates the NFIP. They can assist local participating communities in the implementation of the flood plain objectives defined by NFIP. Table 13-2 shows the status of the NFIP.

Recommendation - Nonparticipating entities should become qualified to participate in the National Flood Insurance Program. The Division of Comprehensive Emergency Management should assist.



Floods have damaged Danish Wash

Table 13-2
NATIONAL FLOOD INSURANCE PROGRAM COVERAGE

Participating Communities

Communities	Policies	Communities	Policies
Garfield		Fairview	0
Unincorporated	1	Gunnison*	1
Hatch	2	Manti	2
Panguitch	3	Mt. Pleasant	17
Juab		Moroni	0
Levan	2	Spring City	0
Piute		**Sevier County**	
Unincorporated	0	Unincorporated	8
Circleville	0	Annabella	11
Junction	0	Aurora	1
Marysvale	0	Elsinore	5
Millard		Glenwood	6
Unincorporated	0	Joseph	0
Fillmore*	0	Koosharem*	0
Holden	1	Monroe	2
Kanosh*	0	Redmond*	0
Oak City*	0	Richfield*	2
Sanpete		Salina	5
Unincorporated	2	Sigurd	1
Ephraim	0		

Non-Participating Communities

Communities	Communities
Garfield	**Piute**
Antimony	Kingston
Juab	**Sanpete**
Eureka	Centerfield
Millard	Fayette
Delta	Fountain Green
Hinckley	Sterling
Leamington	Wales
Lynndyl	**Sevier**
Scipio	All communities participate

* NSFHA - No Special Flood Hazard Areas (designated 100 year floodplains)- flood insurance available.